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SITE INVESTIGATION AND STATUS REPORT

ASBESTOS CONTAMINATION

JOHNS-MANVILLE FACILITY

WAUKEGAN, ILLINOIS

TDD# 5-8305-9

**Roy F. Weston, Inc.**  
**Spill Prevention & Emergency Response Division**

In Association with Jacobs Engineering Group Inc., Tetra Tech, Inc.  
and ICF Incorporated

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Prepared by:

WESTON-SPER  
Technical Assistance Team

Kevin M. Pierard

10 June 1983

## INTRODUCTION

On 18 May 1983 TAT was tasked to conduct a review of background information and an inspection on the Waukegan/Johns-Manville facility to determine if an emergency situation exists. TAT member Kevin Pierard scheduled the inspection for 24 May. It was rescheduled at the request of the company and completed on 1 June.

The Johns-Manville facility is located on approximately 300 acres in Waukegan, Illinois (Figure 1). Approximately 160 acres of that area are used for solid waste disposal and waste water treatment. Lake Michigan lies on the eastern edge of the company property.

The inspection revealed large areas of exposed waste (Figure 2) which Manville claims contain no friable asbestos. Of major concern are the solid waste dumping area, where a large amount of white fibrous material was exposed, the sludge spoil area and the area north of the center pump house trough.

Manville claims to abide by NESHAP regulations in regard to the asbestos disposal area. The regulations require that either there were no visible emissions or the waste was covered, within twenty-four hours, with at least six inches of compacted nonasbestos-containing material. The Manville facility began operations in the early 1920s. Few records are available which outline the types and quantities of waste disposed of on site. Although other types of wastes are mentioned, this report is concerned only with asbestos.

## WASTE SURVEY BY JOHNS-MANVILLE

A waste survey was completed by Johns-Manville; the following section has been excerpted from this survey which was submitted by the company, in response to a USEPA inquiry on 7 April 1983.

"In April 1973, a survey was conducted of solid waste generated at the Waukegan facility. The survey considered wastes which previously had been generated but which for some reason had been discontinued and wastes which at that time were being disposed in the on-site disposal area. The results of the survey, which follow, recorded the estimated annual quantity of the waste as well as an estimate of the amount of asbestos contained in the waste.

APRIL 1973 SOLID WASTE SURVEY

Solid Wastes Previously Generated and Discontinued

Solid Wastes Disposed in April 1973

<u>Product</u>	<u>Annual Quantity</u>	<u>Estimated Percent Asbestos</u>	<u>Status</u>
Auto & IND. Lining	130,000 lbs.	55%	Discontinued 4/30/83
Barke Blocks	315,000 lbs.	65%	Discontinued 2/1/73
No. 6401 Brake Blocks	16,000 lbs.	39%	Discontinued 2/1/73
1257 Tan Brake Blocks	89,000 lbs.	65%	Discontinued 2/1/73
Friction Materials Sludge	32,000 lbs.	60%	Discontinued 5/1/73
#60 Service Sheet	838,000 lbs.	80%	Cut gasket discontinued 12/15/72; reject sheet sold at discount to gasket cutters.
#61 Service Sheet	200,000 lbs.	80%	Cut gasket discontinued 12/15/72; reject sheet sold at discount to gasket cutters.
Disc Brakes	Inc. in F.M. Sludge	60%	Discontinued 4/30/83
Steel Back Clutch Facings	10,000 lbs.	60%	Discontinued 2/1/73
Transite Pipe	5,800,000 lbs. or 2,900 tons	15%	Recycled

Solid Wastes Disposed in April 1973

<u>Product</u>	<u>Annual Quantity</u>	<u>Estimated Percent Asbestos</u>	<u>Status</u>
Millboard	25,000 lbs.	80%	No sheet material
Flexboard and Transitop	2,250,000 lbs.	22%	Trim, scrap and dust
Saturating Felt Roofing	5,472,000 lbs. or 2,736 tons	50%	No use found
Asphalt Roll Rfg.	13,344,000 lbs. or 6,672 tons	17%	1/3 asbestos felt 2/3 organic felt
Transite Pipe	8,748,000 lbs. or 4,373 tons dry	15%	Excess of recycle
	572,000 lbs. or 286 tons wet	15%	Wet end collector

"In anticipation of filing the notification required by Section 3010 of RCRA, estimates of the quantities of hazardous waste, that prior to 18 August 1980 were identified under or listed pursuant to Section 3001 of RCRA, were made by Johns-Manville in August 1980:

<u>EPA No.</u>	<u>Generic Name</u>	<u>Trade Name or Use</u>	<u>Monthly Quantity</u>
F003	Xylene	Paint thinner	300 pounds
	Raw Asbestos	Asbestos	750 pounds
D007	Chromium	Chromic oxide	14 pounds
D008	Lead	100B Lead	4 pounds
U244	Thiuram	Methyl Tuads	1 pound plus 8 inner liners

"It was also estimated at the time that the following quantities of hazardous waste were disposed in an encapsulated form, that is as the trim from or reject of a finished product:

<u>Waste</u>	<u>Monthly Quantity</u>
Asbestos	14,190 pounds
Thiuram	136 pounds
Lead	298 pounds
Chromium	3,077 pounds

"In addition, it was estimated that 17,410 pounds of waste asbestos per month was contained in the slurry going to the settling basins. However, with the shut down of the Waukegan facility's papermill and asbestos felt line in September 1981, it further was estimated that the amount of waste asbestos contained in the slurry would be reduced by 9,000 pounds per month.

"In the period which elapsed between filing the notification required by Section 3010 of RCRA and the filing of an application for a RCRA permit in November 1980, the Waukegan facility was successful in reducing the quantity of hazardous waste disposed. Various manufacturing processes were modified so that asbestos which formerly would have been disposed as waste was reused to manufacture products. The quantity of xylene which became waste was reduced by instituting a recovery procedure whereby xylene which was contaminated by paint was collected, was allowed to settle, and then was siphoned off. The xylene remaining after this procedure was a relatively small quantity which adhered to the paint particles and was disposed. In November 1980, it was estimated that the quantity of waste xylene would be eight gallons per year or approximately 65 pounds.

"Beginning in December 1980, monthly estimates have been made of the amounts of hazardous waste, as identified under or listed pursuant to Section 3001 of RCRA, and of raw asbestos disposed of in the on-site disposal area.

MONTHLY ESTIMATES OF  
HAZARDOUS WASTE AND RAW ASBESTOS  
(in pounds)

<u>Period</u>	<u>Raw Asbestos</u>	<u>D007** Chrome</u>	<u>D008** Lead</u>	<u>F003 Xylene</u>	<u>U244 Thiuram</u>
<u>1980:</u>					
Dec.	54.9	22.5	--	--	--
<u>1981:</u>					
Jan.	17.8	--	--	--	--
Feb.	83.6	--	--	--	--

\*\* The quantities of chrome and lead estimated are not those derived as a result of performing the test for EP toxicity prescribed in USEPA's RCRA regulations, 40 C.F.R. § 261.24 (1982). Rather, these are gross quantities estimated to be contained in the waste disposed of on-site during the months indicated.

<u>Period</u>	<u>Raw Asbestos</u>	<u>D007 Chrome</u>	<u>D008 Lead</u>	<u>F003 Xylene</u>	<u>U244 Thiuram</u>
Mar.	27.6	26.4	--	--	--
Apr.	40.0	24.0	--	--	--
May	30.9	26.4	--	--	--
Jun.	36.9	4.4	--	--	--
Jul.	36.2	--	0.2	--	1.1
Aug.	33.2	--	3.8	--	--
Sep.	49.5	--	0.8	--	10.2
Oct.	137.9	1.6	1.0	--	61.0
Nov.	146.3	19.5	0.5	--	61.9
Dec.	101.8	19.5	0.3	--	43.7
<u>1982</u>					
Jan.	152.1	--	1.0	--	80.0
Feb.	164.1	--	1.0	--	80.0
Mar.	171.1	--	1.0	--	91.7
Apr.	87.2	27.2	1.0	--	41.6
May	43.9	37.9	3.2	--	19.8
Jun.	63.2	--	1.0	--	19.0
Jul.	82.1	--	1.0	--	40.1
Aug.	124.8	--	2.0	--	65.2
Sep.	85.0	--	2.0	--	39.0
Oct.	72.6	--	2.3	--	33.0
Nov.	23.4	--	1.4	--	4.6
Dec.	21.8	--	1.1	--	3.5

<u>Period</u>	<u>Raw Asbestos</u>	<u>D007** Chrome</u>	<u>D008** Lead</u>	<u>F003 Xylene</u>	<u>U244 Thiuram</u>
<u>1983:</u>					
Jan.	23.4	--	--	--	--
Feb.	23.1	--	--	--	--

"The monthly estimates given for raw asbestos are those of non-encapsulated fiber disposed of by the facility. Such fiber is placed in plastic bags, sealed, and labeled and is placed in the on-site disposal area where it is covered, within twenty-four hours, with at least six inches of compacted, non-asbestos-containing material. In addition to this waste asbestos, other asbestos (in the form of asbestos fibers which have been encapsulated into a cementitious or rubber matrix, those which have been added to a slurry going to the settling basins, and those contained in sludges dredged from the settling basins and placed in designated sections of the on-site disposal area) is disposed at the facility in a manner which complies with that required by the NESHAP for asbestos.

"In reviewing these descriptions of the estimated volume and rate of asbestos and other hazardous substances disposed at the Waukegan facility's on-site disposal area, it must be noted that both the volume and type of waste disposed at the facility has changed over the years. This has occurred for a number of reasons. Because of changes in product lines, the asbestos fiber used in manufacturing at the Waukegan facility in 1981 was 41.6% of that used in 1974 and in 1982 was 7.7% of 1974. The amount of asbestos disposed also has been reduced because of the facility's success in reusing a large amount of asbestos which previously was disposed as waste. Finally, the depressed condition of the economy, in general, and of the building materials industry, in particular, has caused the Waukegan facility to reduce its production, and hence the amount of waste created and then disposed."

Any of the foregoing statements are strictly Johns-Manville information and have not been confirmed by TAT or the USEPA.

#### SAMPLING

On 28 April 1982, an airborne asbestos survey was conducted at the facility by Ecology and Environment, Inc. Field Investigation Team.<sup>1</sup> No attempt was made for compliance style sampling, samples were collected at upwind, midsite and downwind locations (Figure 3). Samples were collected over a 7.5 hour period on cellulose ester membrane filters and were drawn by Sierra/Andersen Virtual Impactors. Fibers with an aerodynamic size of 2.5 um to 15 um were collected on coarse filters, fibers less than 2.5 um were collected on fine filters. Results are as follows:

<sup>1</sup>Airborne asbestos survey - John Mansville, Waukegan, Illinois.

4-28-82

TDD# F5-8203-2-03



Sample Number	Sample Point	Air Filtered (m <sup>3</sup> )	Calculated Chrysotile Fibers (fibers/CC <sup>3</sup> )
A1613	upwind (coarse)	.685	0.7
A1614	upwind (fine)	6.15	0.02
A1615	midside (coarse)	.752	12.0
A1616	midside (fine)	6.75	0.2
A1617	downwind (coarse)	.752	21.0
A1618	downwind (fine)	6.8	0.0

These results would indicate that significant amounts of chrysotile fibers were leaving the site, however, upon review by the Centers for Disease Control (CDC) some questions were raised as to the sampling and analytical techniques (letter dated 3 December 1982 from Superfund implementation group to Peter McCumiskey, EPA).

Specific comments from the CDC were:

"The type of sample collection was inappropriate for asbestos (any fibers). Using a Sierra/Anderson Virtual Impactor has no useful purpose in fiber collection, especially when fibers are going to be sized by electron microscopy. Total dust sample collection would have been the preferred method.

"Sample flow rates were too low for ambient air collection. Due to the sample device used, they were limited to 15.0 lpm.<sup>2</sup> With a total dust sample a much broader range of flow rates could have been used.

"Analysis by electron microscopy (EM) has not been standardized. Techniques such as type of filter, sample preparation methods, type of EM analysis, etc., vary depending on where the sample is collected (i.e., water, air) and the intended purpose of the collection (i.e., fiber concentration, fiber identification, fiber sizing). The method used in the study is one approach that is often used. However, there are some potential problems with the method. First, the cellulose filter used in collection needs to be ashed to remove organic material. It is then mixed with a dispersion solution and filtered through a nucleopore filter. During this process there is a potential for breaking fibers, thus increasing fiber counts/concentration; and losing some of the sample (fibers) during ashing and transfer of the material to the other filter type (nucleopore)."

<sup>2</sup> lpm - liters per minute

Therefore, the CDC could not estimate the degree of health risk from the site with any certainty.

#### SITE HAZARDS

Due to the shape and small size of asbestos fibers, they may easily become airborne and remain so for long periods of time. There has been extensive documentation of the ability of airborne asbestos to cause cancer and lung damage through inhalation.

OSHA limits for employee asbestos exposure over an 8-hour period is 2 fibers, longer than 5 micrometers, per cubic centimeter of air. OSHA regulations set a ceiling concentration (one time exposure) limit at 10 fibers, longer than 5 micrometers, per cubic centimeter of air. These limits were initiated in 1976. The population within one kilometer is approximately 380, within five kilometers the population is 67,000.

#### RECOMMENDATIONS

We feel that the Manville facility may represent a threat to residents in the area; however, questionable air monitoring data and the lack of recent waste analysis make an accurate assessment impossible. It is therefore recommended that a waste sampling program be initiated at the site to determine if asbestos is present in the exposed refuse and sludge. If, in fact, asbestos is present in exposed material, that material should be watered down and covered with at least 6 inches, nonasbestos-containing material.

Air monitoring for asbestos during this operation should be done in a manner which is approved by NIOSH or the CDC.

FIGURE 1

A graphic scale bar with three units of measurement. The top scale is in miles, ranging from 0 to 1. The middle scale is in feet, ranging from 0 to 7000. The bottom scale is in kilometers, ranging from 0 to 1. The scales are aligned such that 1 mile is approximately equal to 5280 feet and 1.6 kilometers.

CONTOUR INTERVAL 10 FEET

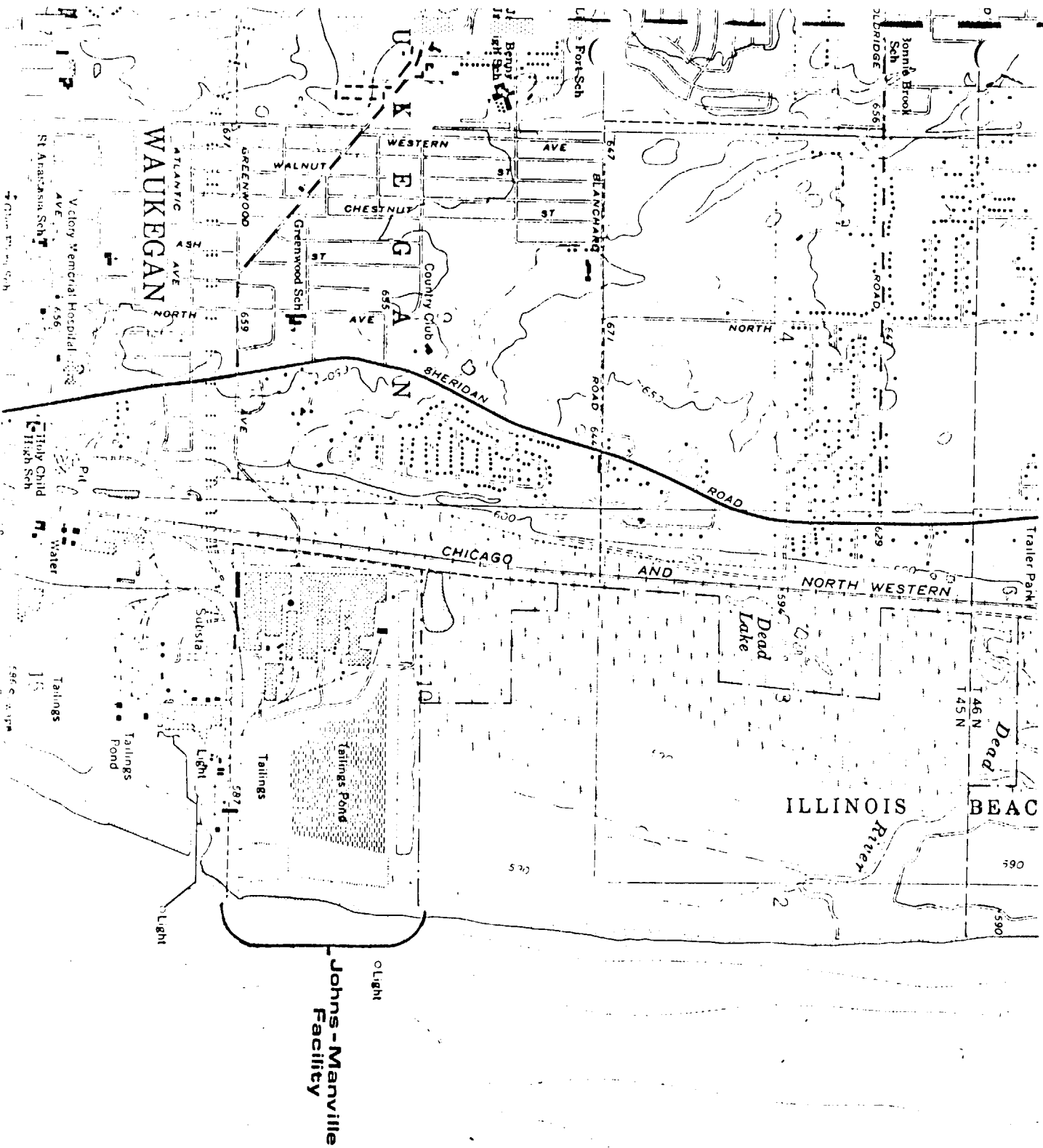
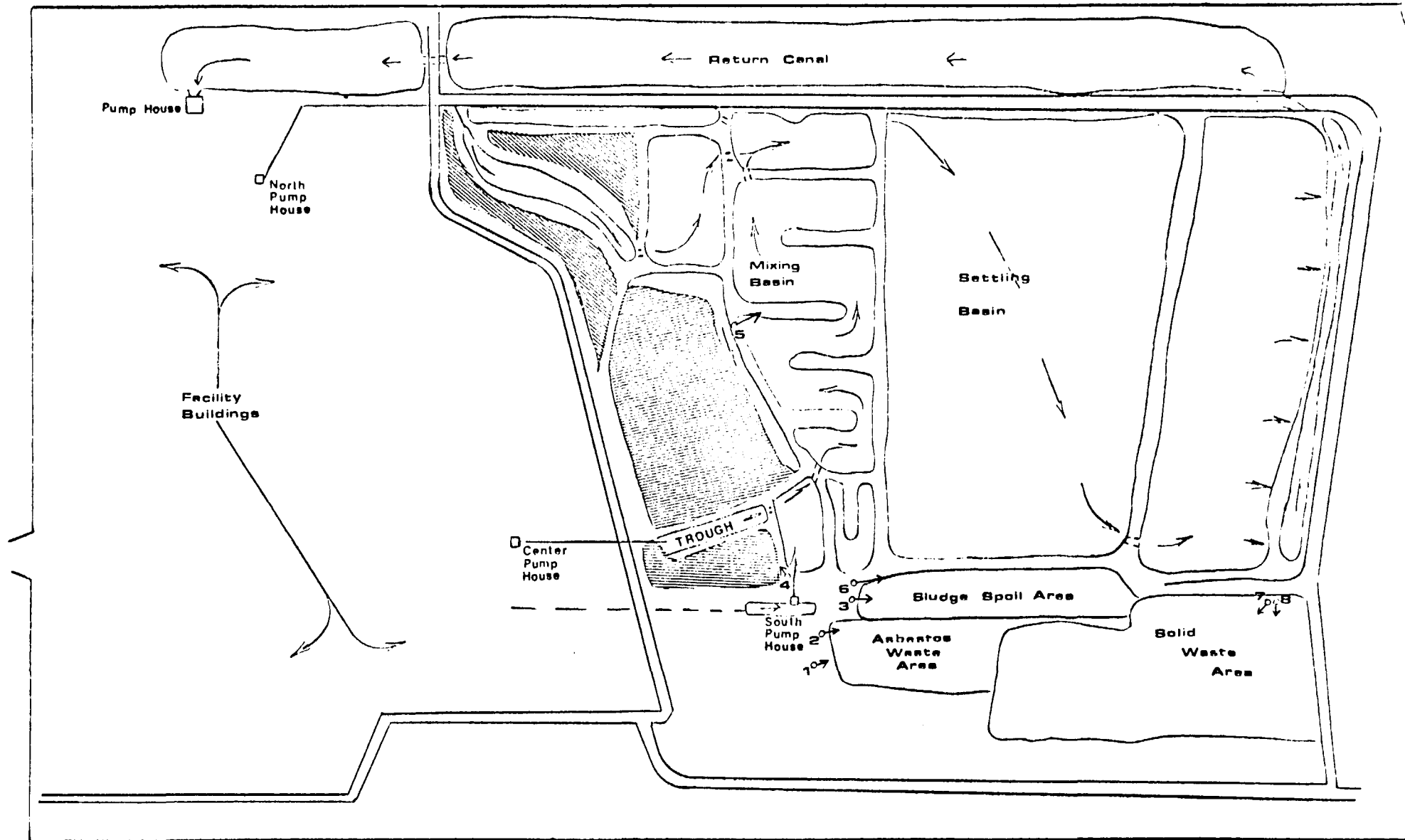


FIGURE 2



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# Johns-Manville Facility



OLD FILL AREA

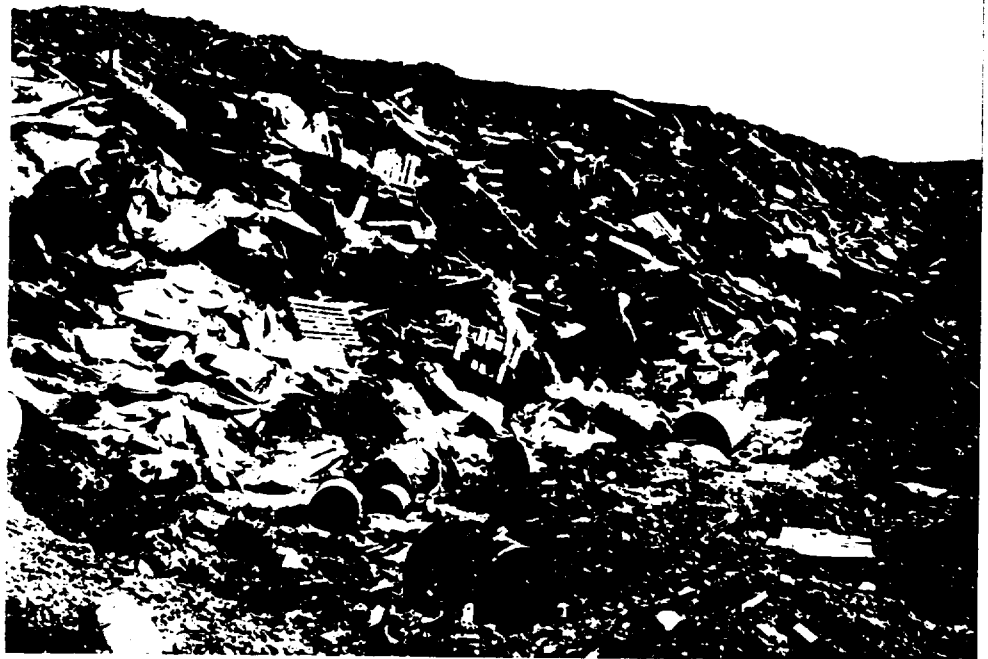
no scale

Photo Number & Locations

*JP*

All photos were taken  
on 1 June 1983 between  
1030 and 1300, by Brad  
Benning (IEPA).  
Locations recorded by  
Kevin Pierard (TAT).

1. Looking Northeast  
at asbestos waste  
dumping area.
2. Looking Northeast  
at South wall of  
the sludge spoil  
area.
3. Looking East at  
the sludge spoil  
area.

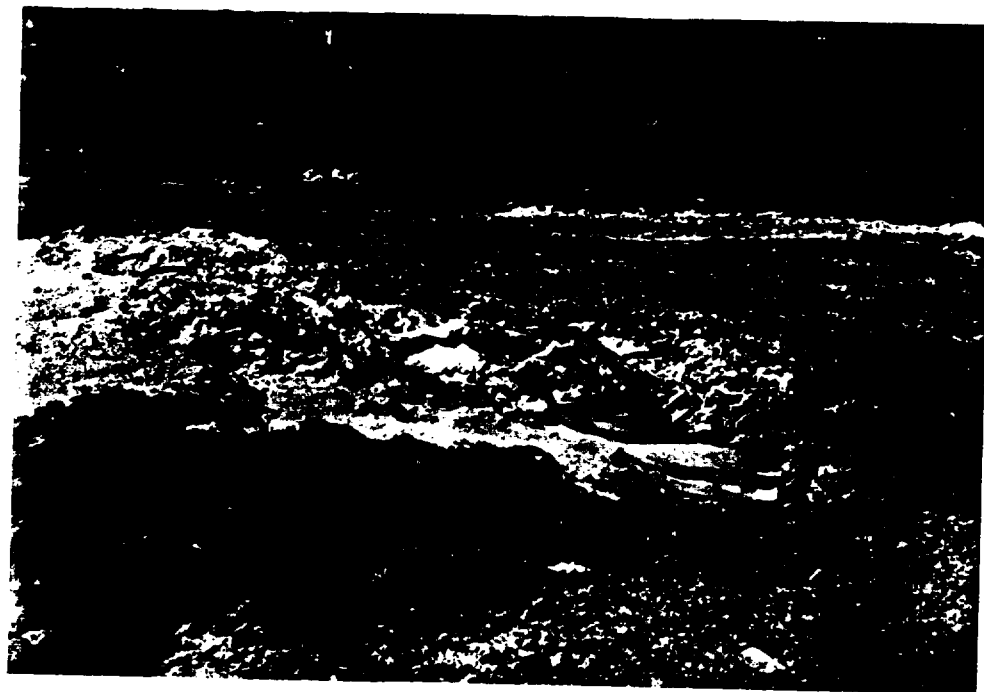




4. Looking Northwest  
at area North of  
center pump house  
trough.
5. Looking Northeast  
at mixing basin.
6. Looking Northeast  
from sludge spoil  
area berm at large  
settling basin.



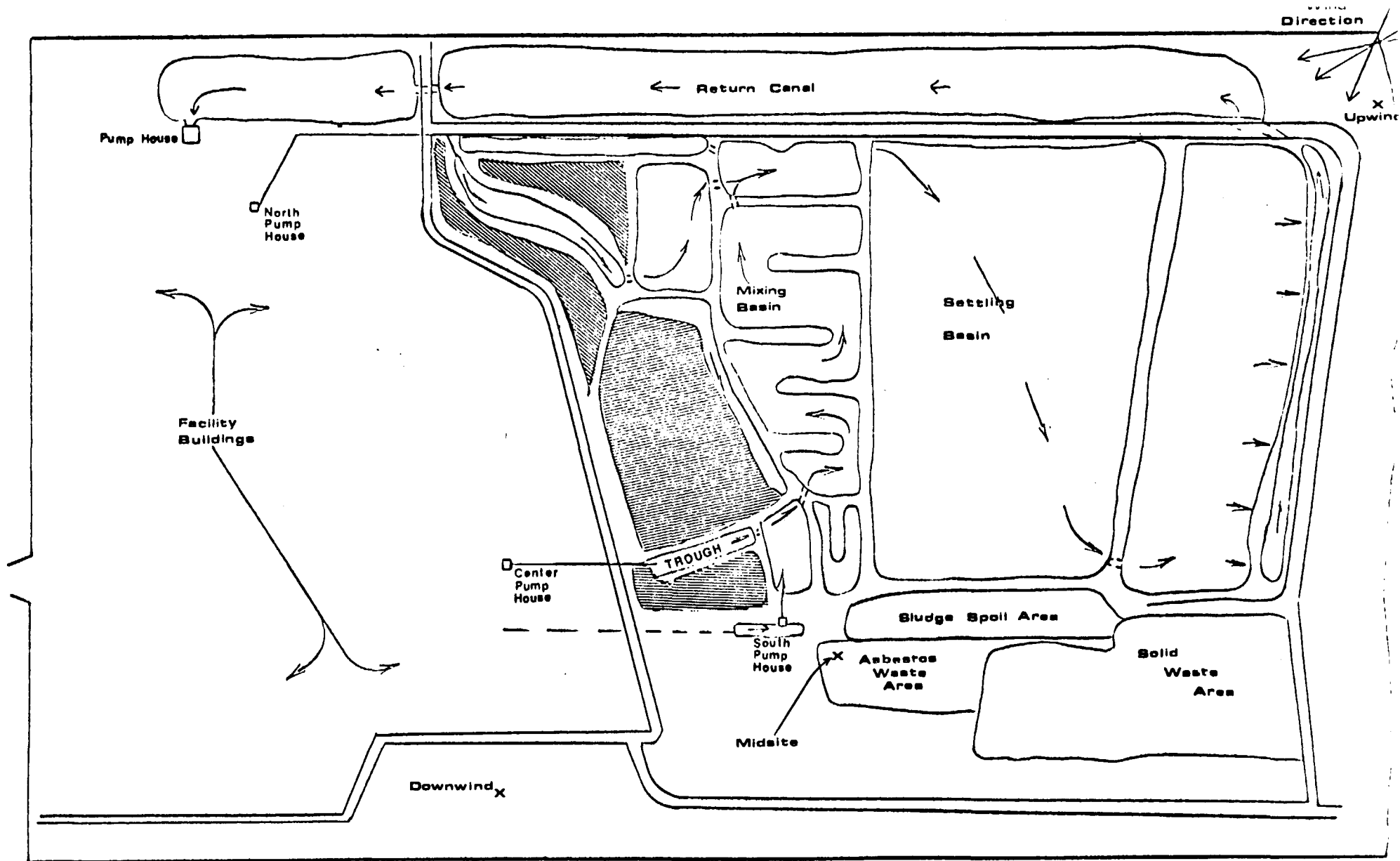




7. Looking Southwest  
at solid waste fill  
area.
8. Looking South at  
solid waste fill  
area.



FIGURE 3



# Johns-Manville Facility

 OLD FILL AREA

no scale

X Airborne Asbestos Sampling Location

(4/8/82)

*JP*

**SAFETY PLAN**

WESTON SPER

Region V  
 Date 5/25/83  
 TDD# 5-8305-9

SAFETY PLAN

A. Incident Description

1. Location Johns-Manville  
Greenwood Ave.  
Waukegan, Il, 60087
2. Date 5/25/83
3. Type: Spill ☐ Fire ☐ HW Site ☒ Other Asbestos Disposal
4. Status Operating
5. Response Objectives Determine if Emergency action is needed
6. Background Review: Complete ☒ Partial ☐  
 If partial, why? \_\_\_\_\_
7. Hazard Level: High ☐ Moderate ☒ Low ☐ Unknown ☐  
 Inhalation ☒ Ingestion ☐ Contact ☐ External ☐
8. Site Plan/Sketch Attached Yes ☐ No ☒
9. Background Material attached Yes ☐ No ☒

B. Material Description

1. Type: Liquid ☐ Solid ☒ Sludge ☐ Vapor/Gas ☐
2. Chemical Name/Class Asbestos (Amosite, Amphibole)
3. Characteristics: Corrosive ☐ Ignitable ☐ Volatile ☐  
 Toxic ☒ Reactive ☐ Biological Agent ☐
4. Toxicity: TLV \_\_\_\_\_ IDLH \_\_\_\_\_
5. Special Hazards \_\_\_\_\_
6. Acute Exposure Symptoms Shortness of breath of gradually increasing intensity and a dry cough,

C. Site Description

1. Size 300 acres
2. Surrounding Population approx, 400 within 1 mile
3. Buildings/Homes \_\_\_\_\_
4. Topography Flat Lake Michigan 300 feet to the East
5. Receiving Waters Lake Michigan
6. Weather 70° Sunny
7. Unusual Features \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
8. Site History site opened in early 1900's  
\_\_\_\_\_  
\_\_\_\_\_

D. Personnel Protection

1. Entry Level of Protective clothing : A ☐ B ☐ C ☒ D ☐
2. If not B, why? Contaminant did warrant Level B  
\_\_\_\_\_
3. Site Instrument Readings:  

% O2 _____	% LEL _____
Radioactivity _____	HNU _____
OVA _____	Other _____
4. Was protective level up or downgraded: Yes ☐ No ☒  
Up or Down graded to: A ☐ B ☐ C ☐ D ☐  
Why \_\_\_\_\_  
\_\_\_\_\_  
Actual Change: \_\_\_\_\_  
\_\_\_\_\_
5. Respirator Protective Equipment:  

SCBA _____	Canister Type _____
Gas Mask _____	Cartridge Type <u>GMD-H Combination</u>
Ultra Twin <u>x</u>	
Dust Mask _____	
6. Protective Clothing:  

<u>Boot Covers</u>	<u>Nitril gloves</u>	_____
<u>Steel toe boots-</u>	<u>Hard hat</u>	_____
<u>Tyvek suit</u>	<u>Ultra twin</u>	_____

7. Field Monitoring Equipment and Materials:

None \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

E. Decontamination Procedures

1. Attach sketch showing Exclusion Zone, Contamination Reduction Zone, Support Zone and numerically labelled Decontamination Stations.
2. For each decontamination station note procedure and materials needed on an attachment page.

F. General Information

1. Team members

Kevin Pierard \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Site Safety Coordinator Kevin Pierard

G. Emergency Information

1. Have nearby people been evacuated: Yes ☐ No ☒  
If yes ever how large an area \_\_\_\_\_

2. First Aid Instructions remove disabled person to uncontaminated area  
and treat ailment.  
\_\_\_\_\_  
\_\_\_\_\_

3. Sources of help

	Name	Town	Phone	Notifi. Yes
Fire	Waukegan		689-7503	
Police		Waukegan	689-7550	No
Ambulance				NO
Hospital	St, Teres	Waukegan	249-3500	No
Poison Information				
Airport				
Heliport				
Site Telephone	Johns- Manville	Waukegan	623-2900	
Nearest Telephone				

4. Emergency Telephone Numbers

WESTON Hot Line	215-524-1925 or 1926
WESTON NPO	215-431-0797 or 0798 or 692-3030
P. B. Lederman - NPM	201-665-0359 (Home)
S. M. Gertz - HSO	215-667-5461 (Home)
Medical Emergency	513-421-3063 (National Service)
EPA - ERT Emergency	201-321-6660
Chemtrec	800-424-9300
Central Disease Control	404-329-3311 (day) 404-329-3644 (night)
National Pesticide	800-845-7633
Medical Emergency	(Regional Service)

Prepared by \_\_\_\_\_  
Date \_\_\_\_\_

Approved by \_\_\_\_\_  
Date \_\_\_\_\_

(For HSO Use Only)

Reviewed and Comments \_\_\_\_\_

Action Required? Yes ☐ No ☐ If yes, what action \_\_\_\_\_

Followup carried out? Date \_\_\_\_\_

S. O. Signature \_\_\_\_\_ Date \_\_\_\_\_